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W. B. No. 133.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

INSTRUCTIONS

GOVERNING THE

CORN, WHEAT, COTTON, SUGAR AND RICE REGION SERVICE.

PREPARED UNDER DIRECTION OF
WILLIS L. MOORE,
CHIEF OF WEATHER BUREAU.

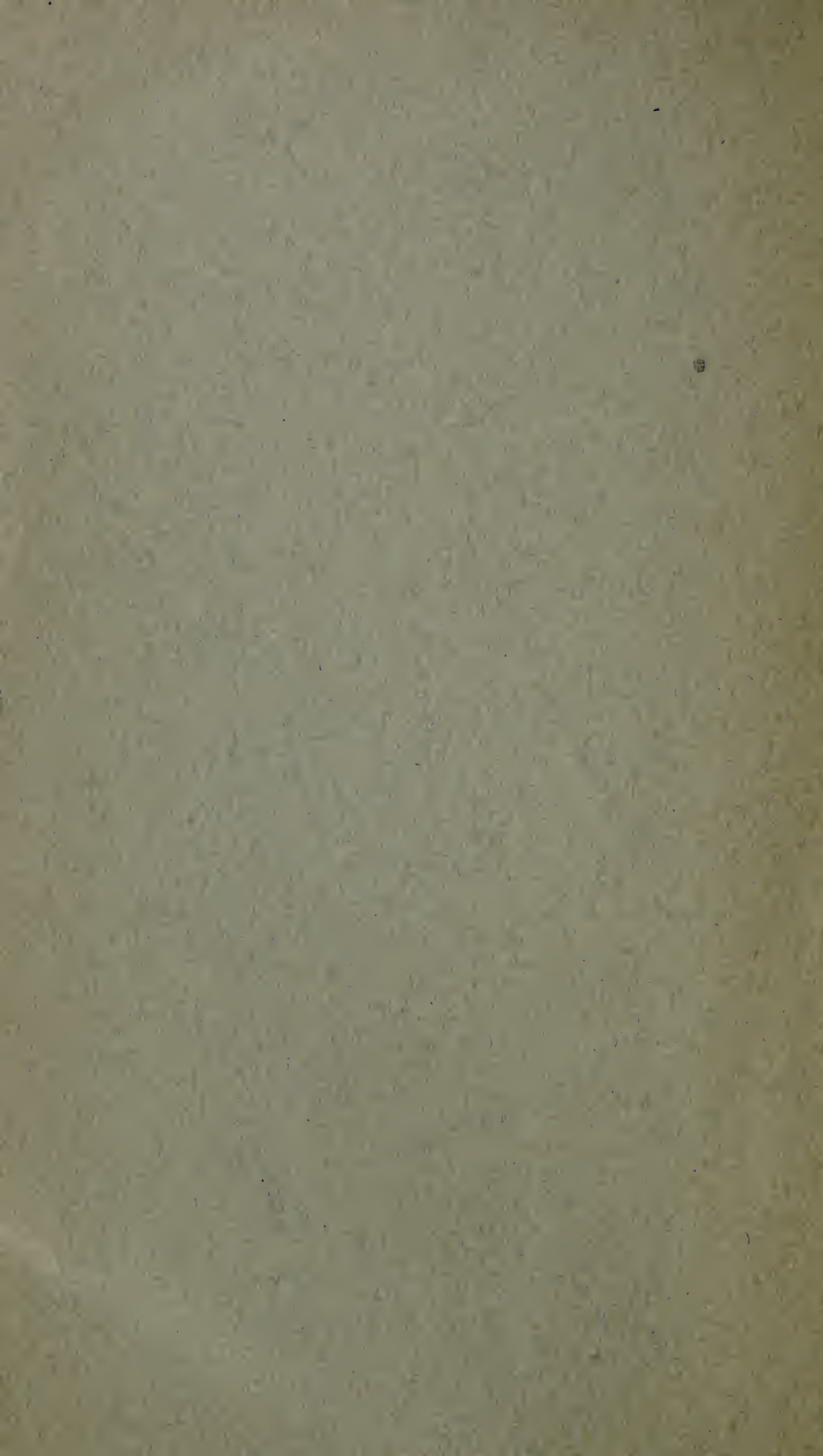
BY

JAMES BERRY,
CHIEF OF CLIMATE AND CROP DIVISION.



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WEATHER BUREAU.
1897.

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INSTRUCTIONS GOVERNING THE CORN, WHEAT, COTTON,
SUGAR AND RICE REGION SERVICE OF THE
WEATHER BUREAU.

The corn, wheat, cotton, sugar, and rice crops of the United States represent values approximating or exceeding a billion dollars annually, and the many disasters to which they are exposed from drought, floods, violent storms, and sudden or decided changes in temperature have created a demand for such information as can be used in determining, at frequent intervals, the condition of these crops.

To meet this demand the Weather Bureau of the Department of Agriculture has provided a system of daily reports of maximum and minimum temperatures, rainfall, state of weather, occurrence of frost, destructive storms, etc., during the season of planting, cultivating, and harvesting. Such information is collected from about 260 stations so distributed as to furnish data from the most important districts in which the several crops are cultivated, and daily bulletins are issued from selected district centers, under which the substations are grouped, giving in detail the data collected from all stations under the respective centers, together with the averages from all other districts.

The following instructions are for the guidance of officials in charge of district centers and observers at substations:

As erroneous records are misleading and valueless, proper exposure of instruments is of the first importance. Officials in charge of district centers should see that instruments at substations are given proper exposure. The exact location of thermometer shelters and rain gauges should be ascertained and recorded on Form 4029. Observers at substations should promptly report any change made in the location of instruments to the official in charge of the district center, who will inquire into and see that the new location affords satisfactory exposure.

Officials in charge of district centers will see that observers at substations are thoroughly acquainted with and prompt in the performance of their duties. The observer at each substation should be fully informed as to the time the telegraphic report should be filed to insure its receipt at the district center in time to be included in the district averages telegraphed to other centers. Whenever it is impracticable to secure satisfactory service, action will be taken for its

improvement, and if the fault be due to neglect on the part of the observer, the duties will be placed in other hands. At the beginning of each season the official in charge at the district center will forward to the Central Office a list of observers in his district who are to serve for the ensuing season. The list, besides showing in full the name of observer, should give his birthplace and residence (State). Changes in the personnel of observers should be reported promptly to the Central Office, with particulars as to date the retiring observer relinquished and his successor assumed the duties of the station. A statement showing birthplace and legal residence of the new observer should accompany the request for his employment.

The duties of observer consist in taking and recording one observation daily, of (1) maximum temperature; (2) minimum temperature; (3) amount of rainfall during past twenty-four hours; (4) state of weather at time of observation; (5) occurrence of light or killing frost, severe storms, tornadoes, or violent thunderstorms, and telegraphing the reports daily (except Sundays and legal holidays) to designated district centers, the messages to be written on Form No. 1061. The observations must not be taken later than 8 a. m., seventy-fifth meridian time, but there is no objection to taking them a half hour earlier. The report must be filed at the telegraph office not later than 8:10 a. m., preferably by 7:45 a. m.

The data collected being for public use, observers are authorized to furnish such information as their records show to all persons requesting it.

The corn and wheat, cotton, and sugar and rice regions are divided into districts and arranged to prevent overlapping of territory, which would produce errors in the preparation of the temperature and rainfall reports. Each district has a center for the collection of reports from the several substations, and the name of the center is the designation of the district.

Following is a list of "Centers" of the several districts:

CORN AND WHEAT REGION.

Chicago, Ill.	Indianapolis, Ind.	Minneapolis, Minn.
Columbus, Ohio.	Kansas City, Mo.	Omaha, Nebr.
Des Moines, Iowa.	Louisville, Ky.	St. Louis, Mo.

COTTON REGION.

Atlanta, Ga.	Little Rock, Ark.	New Orleans, La.
Augusta, Ga.	Memphis, Tenn.	Savannah, Ga.
Charleston, S. C.	Mobile, Ala.	Vicksburg, Miss.
Galveston, Tex.	Montgomery, Ala.	Wilmington, N. C.

SUGAR AND RICE REGION.

New Orleans, La.

The observers receive their instructions from, and render all reports and bills to, the Weather Bureau officials in charge of their respective centers, and are expected to take voluntary observations daily and report monthly by mail to the official in charge of the Climate and Crop Section of their State during the winter season. In employing corn and wheat, cotton, and sugar and rice region observers, preference will always be given to persons cooperating as voluntary observers.

Each station should be supplied with:

- 1 instrument shelter with lock and key.
- 1 board with support for thermometers.
- 1 maximum thermometer.
- 1 minimum thermometer.
- 1 rain gauge.
- 1 rain-gauge support and crate combined.
- 2 rain-gauge measuring sticks.

Also a supply of penalty envelopes, addressed "U. S. Weather Bureau Office;" Form 1005, used at cotton region, and sugar and rice region stations, or Form 1005A, for corn and wheat stations; Form 1061; postal cards, duplicates of Form 1061; Form 2010; Form 2035; Form 2049; and carbon sheets.

All supplies will be furnished by the district center.

The necessary blank forms, stationery, etc., will be furnished to each observer, and in no case will they be purchased by him.

Timely requisition will be made upon the Weather Bureau official of the district center for additional blanks and stationery. All communications should be addressed to the official in charge of the district center.

Whenever public property at a station becomes unserviceable from ordinary use, breakage by accident, etc., the observer will immediately notify the district center, reporting the name of the unserviceable article, and the nature and extent of damage. When repairs can be made at the station, the cost should be stated.

Instructions for use, care, and exposure of thermometers and rain gauges will be found in Instructions for Voluntary Observers, 1897, a copy of which will be furnished upon application to the official in charge of the section center.

Temperatures will be observed and recorded to the nearest whole degree.

Rainfall will be measured and recorded in inches and hundredths.

State of weather will be determined and recorded with reference to the degree of cloudiness and whether precipitation is falling; thus, when the sky is three-tenths or less covered with clouds, record "clear;" from four to seven tenths, "partly cloudy;" eight to ten tenths, "cloudy;" and "sprinkling," "light rain," "heavy rain,"

"light snow," "heavy snow," "sleeting," "hailing," "threatening," "clearing," when these conditions exist at time of observation.

When light fog, light haze, or light smoke is observed with no clouds, the state of the weather will be recorded "clear." When dense smoke, dense fog, or dense haze is observed the state of the weather will be recorded as "smoky," "foggy," or "hazy," as the case may be.

When the conditions are threatening, with no rain, although attended by thunder or lightning, state of weather will be recorded "cloudy," with "threatening" written immediately after.

When a thunderstorm is prevailing at time of observation, "thunderstorm" will be entered after state of weather, in same column. If rain is falling at time of observation and has been preceded within an hour by thunder or lightning, "thunderstorm" will also be entered after the word indicating state of weather and in same column.

Form 1061 will be used for filing daily telegraphic report of observation; a duplicate of the report will be made on postal card and mailed to district center, and the data on same entered on Form No. 1005 (or 1005A) as the case may be.

The first word within the heavy lines, on Form 1061, will be the name of the station of observation. Data in succeeding spaces will be entered in the following order: Maximum temperature, minimum temperature, state of weather, rainfall during past twenty-four hours, frost, thunderstorms, etc. Less than .01 inch of rainfall will be telegraphed "trace;" .01, .02, .03, etc., will be telegraphed "one," "two," "three," etc.; .10, .11, .12, etc., will be telegraphed "ten," "eleven," "twelve," etc.; 1.00, 2.00, 3.00, etc., will be telegraphed "one inch," "two inches," "three inches," etc.; 1.01, 1.02, 1.03, etc., will be telegraphed "one one," "one two," "one three," and so on for the greater amounts.

When frost has occurred at, or near, the station the word "frost" (if light frost), or "killing" (if the frost is destructive to vegetation), will be written in the telegraphic report (Form 1061) in the space following the word expressing rainfall, and when there is no rainfall, in the space following the word expressing state of weather.

If a destructive storm, tornado, or violent thunderstorm has occurred at, or near, the station within the past twenty-four hours, the words "destructive tornado" or "destructive thunderstorm," as the case may be, will be written on Form 1061 in the space immediately following the word to express rainfall, unless the word "frost" or "killing" has been written therein, in which case they will be written in the next space.

[Specimen of Telegraphic Report.]

Form No. 1061—Met'l.

U. S. Department of Agriculture,
Weather Bureau.

Telegraphic report of observations.

To Observer, Memphis:

May 1, 1895, 7 a. m.

Milan.	Fifty-four.	Thirty-six.	Cloudy.
One twelve.	Frost.	Destructive storm.	

Sent at 7:15 a. m.

J. Jones, Observer.

At the close of the month the sums and means of the various columns of Form 1005 or 1005A will be carefully obtained and entered at the bottom of the form, and the summary on right margin should then be filled in. This report will be made in duplicate, one copy to be forwarded to the official in charge of the district center not later than the second of the following month, and the other copy retained at the station for reference.

Care must be taken to enter on Form 1005 (or 1005A) all observations taken, as this report is used in auditing the observer's account for services.

The pay of observers is 20 cents per observation when taken, recorded, and telegraphed to the district center in accordance with instructions.

The Bureau reserves the right of withholding payment from any observer who neglects to make his reports accurately and promptly, and pay for each and every observation not telegraphed to the district center will be deducted from the observer's account for services.

Observations will be made at the usual hour on Sundays and holidays, and reports forwarded by telegraph on the day succeeding the Sunday or holiday at the time of the current day's report, the Sunday or holiday report to be preceded by the name of the day of the week, Sunday, Monday, Tuesday, etc., as the case may be. When legal holidays occur on Monday, the combined Sunday and Monday reports will be telegraphed as usual.

When, from any cause, an observer is temporarily absent and can not sign Form 1005 (or 1005A), he should instruct the person whom he has designated to take the observation during his absence to sign this form as "agent for observer," but the bill and vouchers for services will in all cases be signed by the observer who has been regularly employed.

SEMIANNUAL REPORT.

Form 2035, Semiannual Report of Weather Bureau Property, will be

rendered for the six months ending June 30 and December 31 of each year, within ten days after those dates, to the official in charge of the district center, except where the Director of the Climate and Crop Center is accountable for the instruments, when it will be rendered to that official and a copy retained for reference.

Blank forms, envelopes, and rain-measuring sticks are expendable and may be dropped from Form 2035 when used. Thermometers, gauges, etc., are not expendable, and in the event of their becoming unserviceable from ordinary use, they must not be thrown away or destroyed, but retained to be disposed of by the district center. All instruments, etc., of this character must be carefully accounted for on Form 2035, and not dropped until authority therefor is received.

Form 2035 will be made up in the following manner, after the headings have been filled in:

The data to be noted in the column "On hand from last report," will be copied from the column "On hand to be accounted for" from the previous Form 2035. In the column "Received during month of —," will be noted, under the proper heading, any property received during the six months. If the name of any of the articles received are not given in the printed list of property, they will be written in the blank spaces provided for the purpose, and the number or quantity of each noted in the proper column. In the column "Total" will be entered, under each item, the amount on hand from last report, and what may have been received during the six months. In the column "Issued, expended, and returned," etc., will be noted under each heading the amount of property that has been expended, or returned to the district center, during the six months. In the column "On hand to be accounted for," etc., should be entered under each heading, the total property on hand, less the amount expended, or returned to district center.

When an observer is relieved from charge of a station, he will make, as a final report of property, three copies of Form 2035, one to be forwarded to the official in charge of the district center, one for file at his station, and retain one for his information and protection, in case discrepancies are found.

In making his final report of property, the observer will take up as "On hand from last report" all property for which he was accountable on his last Form 2035, also such property as he may have received since rendering the last semiannual return; carry the whole list down to the column for "Totals;" then, after deducting all articles expended or returned to date of transfer, he will report the remainder of the property as "On hand to be accounted for."

Immediately under the certificate, at the bottom of the form, will be written, "I certify that I have this day received from (name of

observer) the above-mentioned articles in good condition, except as mentioned on margin.”

(Name of new observer.)

The newly appointed observer, before signing the certificate, should verify each article on the report, to assure himself that everything is on hand as stated. His signature to the certificate is the former observer's receipt for the property.

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

MONTHLY METEOROLOGICAL RECORD OF CORN AND WHEAT (OR COTTON REGION) STATION

at _____, during _____, 189—.

Date.	Temperature.		Precipitation in inches and hundredths.			State of weather.	Time observation was taken. A. M. Central time.	Time report was filed at telegraph office. Central time.	General remarks.
	Maximum.	Minimum.	Range.	Began.	Ended.				
1.....	77	68	9	{ 1.00 p.m. 10.15 p.m. }	{ 2.10 p.m. D. N. }	Cloudy.....	6.40 a.m.....	7.00 a.m.....	Mean temperature (obtained by dividing the sum of the mean maximum and mean minimum by two) 71.1°. Highest temperature during month and date, 96°, 3d. Lowest temperature during month and date, 53°, 31st. Monthly range of temperature, 44°. Greatest daily range of temperature and date, 29°, 13th, 28th. Least daily range of temperature and date, 9°, 1st, 23d. Total precipitation during month, 1.95 inches. Number of days on which .01 or more precipitation occurred, 10. Greatest precipitation in any 24 consecutive hours, .38, and date, 24th and 25th. REMARKS. (Note severe storms and unusual phenomena.) Thunderstorms: 1st, 4th, 15th, 24th, 30th. High wind from northwest on 4th.
2.....	89	66	23	.....	.....	Clear.....	"	"
3.....	96	72	24	.....	.....	Clear.....	"	"
4.....	94	68	26	{ 1.45 p.m. 9.15 p.m. }	{ 3.10 p.m. 9.45 p.m. }	Partly cloudy.	"	"	
5.....	78	63	15	.....	.....	Partly cloudy.	"	"
6.....	79	58	21	.....	.....	Partly cloudy.	"	"
7.....	81	60	21	.....	.....	Clear.....	"	"
8.....	84	62	22	10.05 p.m.	10.40 p.m.	Partly cloudy.	"	"	
9.....	89	66	23	.....	.....	Partly cloudy.	"	"
10.....	85	67	18	.....	.....	Clear.....	"	"
11.....	79	60	19	2.30 p.m.	2.35 p.m.	Partly cloudy.	"	"	
12.....	79	53	21	.....	.....	Clear.....	"	"
13.....	85	56	29	.....	.....	Clear.....	"	"
14.....	88	60	28	.....	.....	Cloudy.....	"	"
15.....	86	66	20	{ D. N. 7.45 a.m. 8.15 p.m. }	{ 7.30 a.m. 7.53 a.m. 10.55 p.m. }	Partly cloudy.	"	"	
16....	72	60	12	5.15 p.m.	5.18 p.m.	Partly cloudy.	"	"	
17.....	73	56	17	.....	.....	Clear.....	"	"
18.....	76	56	20	6.10 a.m.	6.15 a.m.	Partly cloudy.	"	"	
19.....	80	58	22	{ 4.23 p.m. 9.25 p.m. }	{ 4.40 p.m. 9.28 p.m. }	Cloudy.....	"	"	
20.....	76	57	19	.....	.....	Partly cloudy.	"	"
21.....	83	56	27	.....	.....	Clear.....	"	"
22.....	83	56	27	8.15 p.m.	.....	Partly cloudy.	"	"
23.....	70	61	9	.....	.....	Cloudy.....	"	"
24....	80	55	25	{ 3.50 a.m. 4.22 p.m. }	{ 10.30 a.m. 4.00 p.m. }	Partly cloudy.	"	"	
25.....	76	61	15	.....	.....	Partly cloudy.	"	"
26.....	80	56	24	.....	D. N.	Clear.....	"	"
27.....	86	62	24	.....	.....	Clear.....	"	"
28.....	86	57	29	.....	.....	Clear.....	"	"
29.....	84	63	21	{ 7.28 a.m. 8.01 a.m. 1.03 p.m. }	{ 7.30 a.m. 9.00 a.m. 1.30 p.m. }	Cloudy.....	"	"	
30.....	76	63	13	D. N.	D. N.	Partly cloudy.	"	"	
31.....	79	52	27	.....	.....	Clear.....	"	"
Sums.	2,529	1,879	650				
Means	81.6	60.6	21.0						

NOTE.—All observations are made at 7 a. m. *Central* time, or 8 a. m. *Eastern* time, at places where the latter is the standard.

